Primer

Technical Requirements for LPFM Station Operations and Guide to Filling Out FCC Form 318 Section V: Engineering Specifications

Prepared on behalf of The General Board of Global Ministries
The United Methodist Church

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Technical Requirements for LPFM Station Operation

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While the FCC hopes that LPFM stations will have relatively simple operations, nonetheless the Commission is requiring LPFM stations to meet most of the same legal and technical requirements that all educational, noncommercial FM stations must meet. Most of these operating requirements are simple and inexpensive, but they include having to participate in the EAS (Emergency Alert System) by installing special equipment, and keeping such records and logs as the FCC might require to ensure that your transmitter is operating properly without causing interference. [For detailed up-to-date operating requirements of non-commercial public radio stations, contact the National Federation of Community Broadcasters.]

Getting Started

There are three main technical elements that are needed to operate a radio station:

- **A physical place to hang an FM antenna.**
- **A place to install a transmitter.**
- **A location for your broadcast studio.**

To apply for an LPFM license, you MUST have a location to install your antenna and transmitter. You do not need a studio location to fill in the application. But eventually you will need a studio site before you go on the air.

Transmission Facilities

Radio

Organizing your station - Outreach

Organizing your station - Fundraising

Organizing your station - Station Structure

Organizing your station - Equipment Tips

FCC Giveaway: Digital Radio

The antenna and the transmitter are your broadcast transmitting elements. This is where your signal originates and goes out into the airwaves. These two pieces of equipment are usually (but not always) installed in proximity to each other. For LPFM, the FCC requires that your transmitter and antenna be located within 10 miles of where your organization functions.

An **FM antenna** is similar to a television antenna that you might put on a roof to improve TV reception. It can be installed on a mast or pole secured to the roof of a building, on a freestanding tower, or on some other structure that elevates it above the ground. This can be anywhere from 100 to 1000 feet or higher, if it is on a hill or mountain.

The signal reaches the radiating elements of the antenna through a special cable that is connected to the transmitter. The cable leaves the transmitter and must be long enough to reach the antenna, feeding the broadcast signal.

The transmitter is generally located in a closet or room on or near the roof, somewhere else in the same building as the antenna, or in a shack or building on the ground under the tower.

The antenna does not need its own power. It gets its power from the transmission signal and is designed to be outside.

The transmitter needs electricity and must be inside, protected from the weather.

Both your antenna and your transmitter must be ìtunedî to the frequency you are assigned by the FCC, so that the signal is broadcast on the correct channel and only that channel. When you purchase your transmitter, you will tell the manufacturer your frequency and it will arrive pre-tuned or with instructions on how to tune it. LPFM antennas are broadband, and will be able to transmit from any frequency you are assigned. The manufacturer will tell you if it needs to be pre-tuned.

Broadcast Studio

The programs you broadcast originate from a control room, also called a broadcast studio. This is the place where the microphones, CD players, cassette machines, and other equipment is located so people can produce live and recorded radio programs. Most commercial and many non-commercial public radio stations have several control rooms and studios, where they can record, edit, mix and broadcast programs all at the same time. But a radio studio does not need to be either expensive or complicated to sound good and be easy to use.

You do not need an FCC license or any permissions to build and run a radio production studio.

You do not need any kind of special room. The studio can be in its own dedicated room, in a closet, or even in a corner of a room that is used for other purposes. The main condition is that it be quiet enough that the room noise does not overly distract from your radio broadcast, or be too confusing to listeners.

Consumer quality equipment, such as CD players and cassette decks, is adequate for most broadcast uses that you might have.

However, if you intend to learn or teach more advanced radio skills or production techniques, or use some equipment very heavily, you might want to invest in professional quality equipment which is more expensive but designed for long-term durability.

To be heard on the radio, the programs that you originate in your studio must travel to the transmitter in one way or another, by cable, or through the air. **Try**

to locate your studio as close to the transmitter as possible. If you can, put the studios in a room nearby where the transmitter is located. Then, connecting the equipment in your studio to your transmitter might only need some cables.

If this is not possible, try to put your studio in the same building as the transmitter. Often, studios are located on one floor of a building and the transmitter is on the roof. The cable between them is run through an elevator shaft, stairway, or other conduit that connects them.

You might have to locate your studio in another building or some other place distant from the transmitter. In this instance, **you will need an STL Studio to Transmitter Link** that will connect your program signal to the transmitter in a reliable way.

There are several ways to set up an STL. One of the simplest is to get a land line to provide a dedicated connection between your studio and your transmitter. This is arranged through a phone service provider and is similar to getting a regular dial-up phone line, but with better quality. There are also other technical solutions, such as using a microwave link, which requires a different kind of license from the FCC. The most cost-effective and reliable method for your station will depend on the particular circumstance and location of your facilities. [You will probably need an engineer to help set up an STL.]

When these three elements - antenna, transmitter, and studio -- are hooked up and turned on, you're on the air!!!

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How Much Will It Cost?

[the application][transmitter and antenna][the studio][hiring an engineer]

The technical costs for an LPFM station fall into three categories. In each area, there are great variables, but you can use these as general guidelines for costs.

Filling out the Engineering Section of the Application

This is a relatively simple form to fill out, but it requires being able to answer a number of specific technical questions required by the FCC. This Guide will help you, but if you decide you cannot or do not want do this on your own, we recommend that you hire a qualified broadcast engineer to fill out this section of the application. Engineers will already know the basic rules for geographic and frequency separation and have the software on hand.

If you hire an engineer, he/she does not have to be local. They do not have to visit you to fill out the application, as long as you provide them with accurate information. The same technical rules apply across the country, and they can run the computer program no matter where you or they live. The costs we have been quoted for doing a frequency search and filling out the application range from $250 - $1,000, but some engineers are charging more. Most applications will probably cost around $500 to complete. However, if your location has special conditions, or if you need an exhibit or additional technical work, be prepared to pay more. [See list of engineers.]

Transmitter and Antenna

By itself, **an LPFM 100 transmitter will cost $3,500 - 6,500, and an antenna will be $1,000 - 2,500.** In addition, you will need coaxial cable to connect them, some related monitoring equipment, and mounting hardware. You might need a

rack or other furniture for your transmitter, and there are always unanticipated costs that are be required out of pocket.

All the equipment is produced by different manufacturers, and you can purchase each piece individually. But **equipment dealers will be putting together transmission packages so you can order everything you need for your transmitter and antenna at the same time.** Based on such variables as how far away your transmitter is from your antenna, and if you will be broadcasting in monaural or stereo, you should expect a complete transmitter/antenna package to cost $5,000 - $15,000. In most cases, buying a complete transmitter/antenna package individualized for your location will be the most cost effective way to get what you need.

Broadcast Studio Equipment

Unlike transmission facilities, there is huge variety in what you may want to put in your studio. You can put together studios with consumer-grade equipment that is purchased or donated, or standard professional quality equipment that costs thousands of dollars.

It is likely that the most expensive single item you will need to purchase is a mixing console, the piece of equipment that allows you to mix microphones, CD players, and other music and recorded sources together to go out over the air. A simple mixer can cost $350 - $2,500 new. Everything else - microphones, CD and cassette players, headphones, etc.-- can range wildly in price. If you are buying everything new, a modest package might cost as little as $2,500. The price goes up from there. You will pay more if you want all digital equipment, or plan to invest in a digital audio workstation (DAW) for program production, which is a computer-based editing system.

Here again, there will be a range of packages available from equipment dealers who will want to sell you stuff you wonít really need. You can hire an engineer to help you with this, but since most of it is regular audio equipment, you can get help from a friendly local musician, sound technician, audiophile or radio producer who knows audio recording and would be pleased to advise you about putting together an appropriate complement of studio equipment.

Hiring Broadcast Engineers

It is likely that at some point during your station construction, you will need a broadcast engineer to assist you with an on-site installation or facilities problem, such as transmitter testing or installing an STL. You might want to make friends with one of the engineers who work for the local commercial or public broadcast station. (Often engineers will work for several stations at the same time.) Most of them will work on an hourly basis for specific projects or emergencies, or on a contract basis for a longer term project. Many of them might be willing to advise you as a volunteer, or charge you only nominal fees.

You can also look for free or inexpensive help from other local technical folks - amateur (ham) radio operators, musicians, producers, computer technicians - people with technical expertise in related fields who can provide the technical assistance you need. It isn't necessary that they be an actual broadcast engineer to be skilled and knowledgeable about equipment operations.

If you have an especially difficult technical problem, **you may have to bring in an outside "expert" from a professional engineering firm.** Be prepared to pay full non-commercial rates for such service, but don't hesitate to negotiate.

"Turnkey" Operators

There are engineering firms that will offer to set up your station on a "turnkey"

basis. That is, **for a single fee, they will do all the work and handle EVERYTHING, from filling out and submitting the application, to ordering and installing the transmitter and building the whole studio.** The costs for such services are generally high. Because most LPFM stations will be technically simple to construct, hiring a turnkey operator is probably not cost effective. However, if you want to consider a turnkey operator, get several bids. Use the cost guidelines outlined above for hardware, and add costs for labor and overhead to provide a rough estimate of what the bid should cost. Be sure the bids are within reasonable range.

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All About Antennas

[location is key][Mounting the antenna][Find your coordinates]

Finding a Good Antenna Location is the Key

To win a new LPFM license, your application will have to meet both geographic and frequency separation rules. Determining your success depends on where your antenna will be geographically located.

The rules determining if a new station will be licensed are based on the existing allocations the FCC uses to grant FM licenses. The place on the dial is called the frequency (i.e. 93.5 FM) but the FCC also calls it a Channel - each frequency has an equivalent channel number. [The FCC has a chart with the parallel frequency and channel assignments for the FM band.]

Because FM radio has been in operation for decades, the FCC has a well-established set of rules governing frequency allocation (though this will radically change with digital broadcasting.). With LPFM they are changing these rules somewhat, but most of them still apply. The rules are based on protecting the signals of existing stations, so that new stations can only go on the air if they do not create any interference to stations already on the air.

Basically, this means that the FCC draws an imaginary geographic circle around every existing broadcast antenna, AND a protected space between each FM frequency already assigned on the dial. Then they will try to fit your station into the spaces between these separations. This is actually a complex calculation that must take into account several interrelated factors, including geographic location of the antenna, its height above average terrain (because FM is line-of-sight, the higher an antenna, the further its signal will reach) and the power of the signal (anywhere between 1-100 watts.)

Based on your proposed antenna location, the FCC will determine if there is an available frequency. The new stations will be licensed to operate anywhere they fit in the FM band, not only in the portion of the band dedicated for noncommercial public radio use, and will be assigned frequency allocations separated from existing stations by at least two channels (first and second adjacent channels).

Where Should You Put Your Antenna?

This is the most important part of Section V, because it will determine if your proposed station can be awarded a frequency on the FM dial.

FM signals travel in line-of-sight, which means that the higher the antenna is off the ground, the further the signal will travel. Any physical obstruction in its way will stop the signal. FM antennas are relatively small and

light-weight, and can easily be attached to a wide variety of supporting structures without any special reinforcement, such as telephone poles, metal or wooden masts, water towers, elevated roof-top structures, and existing towers. So be flexible in looking for a good location. The FCC requires that your antenna be located within 10 miles of your offices or campus.

Try to find the highest location possible for your antenna, such as a spot above other buildings, on top of a hill, or some other place where the signal will not readily hit a geographic feature or large solid object. This might be a pole on the roof of your own building, the roof of a higher building nearby, or some other tall structure in the vicinity. You can also use an existing tower, either one on a roof top, or freestanding on the ground.

LPFM antennas are small and lightweight, much like a TV antenna that one puts on a roof to improve reception. They do not need a large supporting structure or special reinforcement to hold them up, and they will have little wind load. You can mount them on a mast or something similar to get elevation.

If you do not own or control the location where you want to mount the antenna, offer to put up a pole or small tower to elevate your antenna. In some cases, you should be prepared to offer compensation or pay rent.

Along with the antenna site, you must secure a place nearby for your transmitter. A 100 watt FM transmitter is not very large or heavy - the box is roughly the size of a desk top computer. It can sit on a shelf or table, or be installed in a rack. The location must have electricity, but does not demand any special power requirements, and it must be inside protected from the weather. Be prepared to pay the electric bill.

Finding your Antenna Coordinates and Broadcast Channel

You will need to know your transmitter location in terms of longitude and latitude co-ordinates, the elevation above sea level, and the height of the structure that the antenna will be built upon. We have not yet figured out whether these online resources are more or less reliable than GPS units- your answer should be accurate to the nearest second- and should be rounded off accordingly. If you have the opportunity, you can try both and let us know if there is a discrepancy.

Geographic Coordinates

Do not use the FCC "co-ordinate locator. " That will tell you the co-ordinates of the center of your town. This can be helpful for checking the general radio environment of your area, but the availability of a license at your location is a whole 'nother issue. Do not enter those co-ordinates as if they are yours, or your application will be rejected! You need the co-ordinates of your proposed antenna site.

This website will give you much more accurate geographic coordinates than using the FCC site.

[http://www.geocode.com/scripts/eagle/eagle.pl?cmd=td_i]

(If that does not work, go to www.geocode.com Then go to "test drive eagle geocoding" it will get you to the same place)

Enter the street address of your proposed site and it will give you the coordinates in both decimal degrees and degrees/minutes/seconds, using the NAD-27 standard required by the FCC.

You need to copy down the degree minute seconds co-ordinates. These

coordinates can then be entered in the FCC Channel Finder to determine if a frequency is available for this location.

Using the FCC's Channel Finder

The FCC's Channel Finder is at [www.fcc.gov/mmb/asd/lpfm/lpfm_channel_finder.html]

What if my frequency and site are not available?

If there is a frequency available at your proposed antenna location- congratulations!

Now scroll down the page and have the channel finder draw you a "Tiger Census" map of the predicted coverage. This process can give you a sense of what parts of your area have open frequencies.

It is important to remember that these maps are very approximate in nature. The program will draw a circle that is exactly 5.6 kilometers in radius around that point. This is the radius within which just about any radio receiver, in any reception condition, should be able to pick up your station. Some receivers (especially the radios in cars, home stereo systems, and radios with external antennas) will pick the station up to two, three or four times further than this "predicted coverage." Some (like Walkmans, and some clock radios) may not even pick you up at the outer edges of your "predicted coverage.

Try to find a location near one of those "good co-ordinates," then repeat the process of checking that place with the geocode site and then the channel finder. This can actually be quite fun when you get the hang of it, like throwing darts at a map to find where your radio station can be.

We are happy to help you do this over the phone or to double check your work.

Filling in the Tech Box on a form 318

Once you have found the correct site for your transmitter, you will be ready to fill out the "Tech Box" on your application. Get a copy of the form 318 here. http://www.fcc.gov/Forms/Form318/318.pdf

Remember that you can no longer file on paper for a low power FM license. You must file at this location: [http://svartifoss.fcc.gov:8080/prod/cdbs/forms/prod/cdbs_ef.htm]

You can also determine your elevation using the following website: [http://www.topozone.com]

Enter the same geographic coordinates, and this site will generate on screen the correct U.S.G.S. topographical map for the location entered.

The maps on this site are very detailed graphically, so they may take some time to

A word about antenna height

Obviously, the height of the location that you build your transmitter on is important. If you have a choice, get the antenna up as high as possible. It should be noted that while not optimal, perfectly adequate coverage can be gotten from a twenty or thirty foot antenna located on a residential rooftop, all other things being equal. Depending on the antenna you choose, It can look less obtrusive than even a standard TV reception aerial.

A word about location

Also keep in mind: While it is best and cheapest to have your studio and transmitter at the same site, nothing needs to be at the transmitter site except for the transmitter, electric power, the antenna, and some sort of receiver for

download based on how fast your internet connection is.

At the top left of the map page are several scales - select 1:25,000, which will give you the most resolution.

At the top right, there are three choices for size - select Large.

What will then appear on your screen will be the section of the map with your exact location, in the largest magnification.

The maps include major geographic features, such as mountains, lakes, rivers, hills, etc. and major man-made features such as airports, hospitals, cemeteries, parks, railroad lines, and significant buildings, streets and highways. At this scale, most of these features should be legible. Natural areas are green; developed areas are pink; water features are blue; and new buildings or constructions are generally shown in purple.

broadcast audio- either via telephone lines or by radio link.

This will add to your costs, but we are currently researching options that are as cheap as $500-$1000 for accomplishing this goal. This way, your studio can be at the most convenient location, and your transmitter can be a relatively unobtrusive appliance in someone's attic.

Your average hundred watt transmitter is a little bigger than a breadbox, and can be stuck on a shelf near a regular electrical outlet.

If you look closely, you will also see a series of brown contour lines that snake across the maps in irregular but roughly parallel patterns. These lines follow the features of the terrain, and they indicate changes in elevation every 10 or 20 feet, depending on the map. Where the elevation rises steeply they will be close together, and where the ground is flatter, they will be spaced farther apart.

Questions Five and Six

If you follow any one of these lines, at some point you will see the line broken by a number that is a multiple of 10. This number indicates the ground elevation, or height above mean sea level, for that contour. With a good pair of eyes (or a large screen monitor) you should be able to find your address and match it up with the nearest contour line. If you are between contour lines, you should interpolate as bast you can. If it is all too blurry, you may have better luck with a printed map, which should be available at a public library.

The answer you get here will be for question 5 in the tech box: "antenna location site elevation above mean sea level." For the answer to question 6, Add the height of your building and then add the height of any pole, tower or other antenna support that will go on the roof.

A tried and true standard is a 36 foot telescoping antenna mast from radio shack- total cost of a do-it-yourself mast installation between $200 and $400. Convert the feet into meters. Do not use the HAAT calculator on the FCC webpage- this is a whole different thing.

Question Seven

The answer to question 7 depends upon what kind of antenna you want to use. You must give this quantity to the nearest meter. Roughly speaking, it is either:

a) 1 meter higher than the answer to question 6 if you are going to use a 5/8 ground plane antenna- About $110, vertically polarized, good for car reception- but you will have to lower your amplifier power to about 50 watts

b) 1 meter lower if you use a simple dipole. You can use the full 100 watts, and the antenna has no gain. You will probably want it horizontally polarized. It will probably not carry as far with the car

receivers as the 5/8 groundplane. It has the advantage of being located a bit below the top of the pole, so if lightning strikes, the surge is more likely to travel down to ground through the mast, rather than through your transmitter. Costs about $100

c) more ambitiously, you can get two circularly polarized antennas. These cost about $400 apiece., plus some more in weird hardware and connectors and such. This is the best kind of antenna, especially for city conditions. It may need a more sturdy tower than just a pole. You will be able to use the full hundred watts. If you use this type of antenna, your answer to question 7, height of antenna radiation center above ground level, should be about 2 meters lower than the top of your tower, or halfway between the connection points of the two antennas, which must be one wavelength apart (about 11 feet). A good budget for this sort of antenna is probably $2000-$2500

Converting your Frequency to a Channel Number

Each FM frequency has a corresponding channel, from 88.1 FM = Channel 201, to 107.9 FM = Channel 300. If you have successfully found a frequency, then you must convert it to the correct channel number.

This is simple. The FCC has an easy channel conversion chart. (Or you can do the math.) **[http://www.fcc.gov/mmb/asd/bickel/chanfreq.html]**

If you have found a frequency and determined its channel, you are ready to fill out Section V.

Filling Out Engineering Section V of FCC Application Form 318

Once you have found a frequency and determined its channel, you are ready to fill out Section V. **Be certain you have a copy of the "Instructions for FCC Form 318" issued by the FCC.** These instructions are dense because they are written in the legal language of the FCC, but you will need the Worksheets that are part of the document.

If you are uncertain about doing this correctly or you want help, we recommend that you hire a professional broadcast engineer or other experienced person fill out the application form on your behalf. They know how to get proper FCC frequencies using geographic coordinates and elevation above sea level. You will have to provide them with specific information, such as street address, and the height of the building where you want to put the antenna. They can figure out the rest.

The TECH BOX

Question 1. Class
Check the Box for LPFM 100

Question 2. Channel
If you have found a frequency using the FCC Channel Finder program, you can convert the frequency to the correct channel using the FCC Channel Conversion chart. Write/type the channel number on the line indicated.

Question 3. Antenna Coordinates
The proposed antenna site must be specified using North American Datum 27 (NAD 27) coordinates. You can determine these coordinates using a 7.5 minute series topographic map from the U.S. Geological Survey.

Fill in the boxes with the correct longitude and latitude based on the location from the U.S.G.S. map. Coordinates must be to the nearest 1 second (degrees, minutes, seconds = DDD MM SS).

Question 4. Antenna Structure Registration Number
Most towers taller than 62 meters (200 feet) and located near airports are registered with the FAA.

If you are NOT using one of these towers, (because you are putting your antenna on the roof of your building) check the box "Not Applicable" If you are putting your antenna on one of these towers, check the box "FAA Notification Filed with FAA." (You do not need to file anything with the FAA - the tower owner is responsible.)

Question 5. Antenna Location Site Elevation Above Mean Sea Level
Determine the ground elevation of your antenna location from the same U.S.G.S. maps that helped you locate longitude and latitude. Then add the height of your building, tower, or supporting structure to the ground elevation indicated on the map.

Question 6. Overall Tower Height Above General Ground Level
This elevation is simply the height of your antenna above the ground. It will be the total height of your building or tower, plus anything added to support the antenna. It must be recorded in meters, rounded to the nearest whole number.

Question 7. Height of Antenna Radiation Center Above Ground Level
This elevation will be the same or very close to the answer in Question 6 but may vary by a meter or two. A single LPFM antenna will have 1, 2, or possibly more radiating elements (called "bays" or "antenna array.") If there is more than one, they are mounted a few feet apart on the support structure or tower. The center of radiation is the middle of this array. If you are using a single bay antenna, your center of radiation will be the same as your antenna height above the ground. (Most LPFM antennas will have only one antenna bay.)

If you are going to use an antenna with 2 or more bays, the center of radiation will be slightly lower than the top of the antenna. Determine it by measuring the distance from the ground to the point half-way between the top of the antenna and the bottom, based on how much space is between each bay when it is mounted. (The antenna manufacturer will know the spacing between bays.) It must be recorded in meters, rounded to the nearest whole number. [See diagrams.]

Question 8. Power and Height Limitations
Check the "Yes" box. This acknowledges that the FCC will determine the authorization for your operating parameters, including power and height (i.e. based on the height of your antenna, you may be authorized to operate at a power less than 100 watts.)

Question 9.
Interference -- You must answer "yes".
Short-spaced stations - answer "N/A"

Question 10. TV Channel 6 Interference (Channel 201-220)
Because of a quirky technical condition on the television spectrum, there are special technical restrictions on FM radio frequencies in places near a Channel 6 TV station. If there is NO Channel 6 TV station within 60 miles of your proposed antenna location, answer "N/A" If there is a Channel 6 television station within 60 miles, AND the Channel Finder has given you an allocation higher than Channel 220, answer "Yes." If there is a Channel 6 TV station within 60 miles, AND the Channel Finder has given you an allocation between 201 - 220, you will need an engineer to assist you in preparing an exhibit to meet any necessary restrictions.

Question 11. National Environmental Policy Act
Over time, broadcast stations have become subject to a range of urban and rural environmental regulations that have an impact on both personal health and environmental protection. This question is intended to ensure that all applicants

certify that their proposed station will have no significant impact on the quality of the human environment. The FCC has provided a worksheet as part of its instructions that must be submitted along with the application.

Go to Worksheet # 2 - General Environmental Worksheet
This is a simple environmental assessment meant to guide you in relevant environmental questions. In order to respond "Yes" to Question 11, you MUST answer "No" to all 8 questions on the worksheet. The worksheets must also be attached with the application. You will answer "No" to the following questions about your new station: Involves high intensity white lighting in residential neighborhoods. Is located in an officially designated wilderness area or wildlife preserve. Threatens the existence or habitat of endangered species. Affect places significant to American history, architecture, etc. Affects Indian religious sites. Is located in a floodplain. Requires construction changing surface features, i.e. filling wetlands, deforestation, etc.

Does not comply with the FCC guidelines on RF (Radio Frequency) exposure.

Question 8 is asked to determine that your antenna will not endanger anyone through harmful exposure to radio waves because it is mounted too close to where they might live or work. The danger level is based solely on the distance between your antenna and the rooftop or ground. Because exposure drops exponentially by distance, the higher the antenna is, the less it will generate harmful exposure. If it is above a certain height, there is no danger at all. That is why there are minimum distances specified. The FCC has provided a worksheet that must be submitted along with the application.

To fill out this question, go to Worksheet # 3 - RF Exposure Worksheet
Complete the calculations on the worksheet according to the instructions.

If you are NOT putting your antenna on a tower with other broadcast stations, that is, mounting it alone on a rooftop or other structure, and it will not be near any other broadcast antennas, you must fill in the distances requested in LP100 #1a and # 1b.

If you ARE CO-LOCATING your antenna on an existing tower with other stations, you must fill in the distances requested in LP100 #2a and # 2b.

When you have completed this worksheet, go back to complete Question 8 on the Environmental Worksheet.

When you have completed both worksheets, return to Question # 11 and answer "Yes." This certifies that you are not subject to any additional environmental review. Most applicants will be able to check No in all boxes of Worksheet #2. If you have answered "Yes" to any of the questions, then you should consult an engineer to assist you with any additional exhibits that might be needed. If you cannot answer "No" to all the questions on Worksheet #2, or your are unable to conclude that your proposal will have no significant impact on the environment, you MUST check "No" in Question #11 and prepare a detailed Environment Assessment as an exhibit. The specific requirements for such an exhibit are outlined in detail in FCC Instructions for FCC Form 318.

Preparer's Certification
The last page of Section V is the certification by the person who prepared this part of the application, because it might be an engineer or someone different from whomever prepared the legal sections. Fill out the form and sign it in blue ink so the FCC knows it is an original signature.

Congratulations

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